WHAT IS CLAIMED IS:

1.   An apparatus for transmitting a preamble in a UWB communication system, which comprises:

a first preamble generator for generating a first preamble for synchronization using an aperiodic sequence with an aperiodic correlation property;

a second preamble generator for generating a second preamble for channel estimation using the aperiodic sequence; and

a transmitter for multiplexing the first and second preambles and transmitting the multiplexed preambles as a preamble of the UWB communication system.

2.   The apparatus according to claim 1, wherein said aperiodic sequence is an ARM (Aperiodic Recursive Multiplex) sequence.

3.   An apparatus for transmitting a preamble in a UWB communication system, which comprises:

a first preamble generator for generating a first preamble for synchronization using an aperiodic sequence with an aperiodic correlation property;

a second preamble generator for generating a second preamble for channel estimation using a periodic sequence with a periodic correlation property; and

a transmitter for multiplexing the first and second preambles and transmitting the multiplexed preambles as a preamble of the UWB communication system.

4.   The apparatus according to claim 3, wherein said aperiodic sequence is an ARM (Aperiodic Recursive Multiplex) sequence.

5.   The apparatus according to claim 3, wherein said periodic sequence is a CAZAC (Constant Amplitude Zero Auto Correlation) sequence.

6.   An apparatus for receiving a preamble in a UWB communication
5   system, which comprises:

a demultiplexer for demultiplexing a received signal and outputting the demultiplexed signal as a first preamble for synchronization, a second preamble for channel estimation, and data;

a correlation detector for performing synchronization using the first
10   preamble and outputting synchronization information based on performance results;

a channel estimator for performing a channel estimation using the second preamble and outputting a channel estimate based on the performance results; and

a data recoverer for recovering original data using the synchronization
15   information and the channel estimate.

7.   The apparatus according to claim 6, wherein said first preamble and second preamble are aperiodic sequences, preferably, ARM (Aperiodic Recursive Multiplex) sequences.

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8.   The apparatus according to claim 6, wherein said first preamble is an aperiodic sequence, preferably, an ARM (Aperiodic Recursive Multiplex) sequence.

25   9.   The apparatus according to claim 6, wherein said second preamble is a periodic sequence, preferably, a CAZAC (Constant Amplitude Zero Auto Correlation) sequence.

10.   A method for transmitting a preamble in a UWB communication system, which comprises the steps of:

generating a first preamble for synchronization using an aperiodic sequence having an aperiodic correlation property;

5   generating a second preamble for channel estimation using the aperiodic sequence; and

multiplexing the first and second preambles and transmitting the multiplexed preambles as a preamble of the UWB communication system.

10   11.   The method according to claim 10, wherein said aperiodic sequence is an ARM (Aperiodic Recursive Multiplex) sequence.

12.   A method for transmitting a preamble in a UWB communication system, which comprises the steps of:

15   generating a first preamble for synchronization using an aperiodic sequence with an aperiodic correlation property;

generating a second preamble for channel estimation using a periodic sequence with a periodic correlation property; and

multiplexing the first and second preambles and transmitting the

20   multiplexed preambles as a preamble of the UWB communication system.

13.   The method according to claim 12, wherein said aperiodic sequence is an ARM (Aperiodic Recursive Multiplex) sequence.

25   14.   The method according to claim 12, wherein said periodic sequence is a CAZAC (Constant Amplitude Zero Auto Correlation) sequence.

15.   A method for receiving a preamble in a UWB communication system, which comprises the steps of:

demultiplexing a received signal and outputting the demultiplexed signal as a first preamble for synchronization, a second preamble for channel estimation, and data;

performing synchronization using the first preamble and outputting
5   synchronization information based on performance results;

performing a channel estimation using the second preamble and outputting a channel estimate based on the performance results; and

recovering original data using the synchronization information and the channel estimate.
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16.   The method according to claim 15, wherein said first preamble and second preamble are aperiodic sequences, preferably, ARM (Aperiodic Recursive Multiplex) sequences.

15   17.   The method according to claim 15, wherein said first preamble is an aperiodic sequence, preferably, an ARM (Aperiodic Recursive Multiplex) sequence.

18.   The method according to claim 15, wherein said second preamble
20   is a periodic sequence, preferably, a CAZAC (Constant Amplitude Zero Auto Correlation) sequence.